



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2013-0072; Directorate Identifier 2013-NE-04-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; Pratt & Whitney Division Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to supersede airworthiness directive (AD) 2013-15-09, which applies to all Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engine models with certain second-stage high-pressure turbine (HPT) air seals, installed. AD 2013-15-09 currently requires initial and repetitive inspections for cracks in second-stage HPT air seals. Since we issued AD 2013-15-09, we received reports of cracking in the original location on two additional part numbers (P/Ns) as well as reports of through-cracks in a new location in the second-stage HPT air seal. PW has developed a redesigned second-stage HPT air seal that addresses the cracking condition in both locations. This proposed AD would expand the applicability of AD 2013-15-09 to include additional P/Ns, require replacement of the mating hardware if the second-stage HPT air seal is found with a through-crack, and add mandatory terminating action to the repetitive inspections. We are proposing this AD to prevent failure of the second-stage HPT air seal, which could lead to uncontained engine failure and damage to the airplane.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: (202) 493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this proposed AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06108; phone: (860) 565-8770; fax: (860) 565-4503. You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call (781) 238-7125.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2013-0072; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: (800) 647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** James Gray, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England

Executive Park, Burlington, MA 01803; phone: (781) 238-7742; fax: (781) 238-7199; email: [james.e.gray@faa.gov](mailto:james.e.gray@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposed AD. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2013-0072; Directorate Identifier 2013-NE-04-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

### **Discussion**

On July 19, 2013, we issued AD 2013-15-09, Amendment 39-17525 (78 FR 49111, August 13, 2013), (“AD 2013-15-09”), for all PW PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engine models with second-stage HPT air seal, P/N 54L041, installed. AD 2013-15-09 requires initial and repetitive inspections for cracks in second-stage HPT air seals and replacement of air seals that fail inspection. AD 2013-15-09 resulted from the discovery of cracks in second-stage HPT air seals. We issued AD 2013-15-09 to prevent failure of the second-stage HPT air seal, which could lead to uncontained engine failure and damage to the airplane.

### **Actions Since AD 2013-15-09 Was Issued**

Since we issued AD 2013-15-09, we received multiple reports of through-cracks in a different location on second-stage HPT air seal, P/N 50L041, and reports of cracking in the original location in two additional second-stage HPT air seal P/Ns, 50L960 and 50L976. The cracking in the two additional P/Ns requires that they be added to the applicability of this proposed AD. PW has developed a redesigned second-stage HPT air seal that corrects the cracking condition in both locations.

The new cracking location in the second-stage HPT air seal, P/N 50L041, is in the front forward fillet radius. PW determined that through-cracks in the front forward fillet radius increase the stresses in the mating hardware in the HPT rotor and that increased stress reduces the life of the first-stage HPT hub, second-stage HPT hub, and second-stage HPT blade retaining plate. Therefore, the first-stage HPT hub, second-stage HPT hub, and second-stage HPT blade retaining plate must be removed from service if the second-stage HPT air seal, P/N 50L041, is found with a through-crack.

### **Relevant Service Information**

We reviewed PW Alert Service Bulletin (ASB) No. PW4G-112-A72-330, Revision 2, dated July 11, 2013, which describes procedures for inspecting the second-stage HPT air seal for cracks and PW Service Bulletin (SB) No. PW4G-112-72-332, Revision 2, dated April 9, 2014, which describes procedures for replacing the second-stage HPT air seal.

### **FAA's Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

### **Proposed AD Requirements**

This proposed AD would expand the population of affected P/Ns, require removal from service of two newly identified P/Ns, require replacement of the mating hardware if the second-stage HPT air seal is found with a through-crack, and add mandatory terminating action to the repetitive inspection requirements.

### **Costs of Compliance**

We estimate that this proposed AD would affect 116 engines installed on airplanes of U.S. registry. We also estimate that it would take about 5 hours to perform the inspection required by this proposed AD. The average labor rate is \$85 per hour. We estimate that two engines will also require replacement of the first-stage HPT hub, second-stage HPT hub, and second-stage HPT blade retaining plate. We estimate that parts would cost about \$698,920 per engine. Based on these figures, we estimate the total cost of this proposed AD to U.S. operators to be \$23,420,020.

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## **Regulatory Findings**

We have determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by removing airworthiness directive (AD) 2013-15-09, Amendment 39-17525 (78 FR 49111, August 13, 2013), and adding the following new AD:

**Pratt & Whitney Division:** Docket No. FAA-2013-0072; Directorate Identifier 2013-NE-04-AD.

**(a) Comments Due Date**

The FAA must receive comments on this AD action by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

This AD supersedes AD 2013-15-09, Amendment 39-17525 (78 FR 49111, August 13, 2013).

**(c) Applicability**

This AD applies to all Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engine models with second-stage high-pressure turbine (HPT) air seal, part number (P/N) 54L041, 50L960, or 50L976, installed.

**(d) Unsafe Condition**

This AD was prompted by additional reports of cracking in the second-stage HPT air seal. We are issuing this AD to prevent failure of the second-stage HPT air seal, which could lead to uncontained engine failure and damage to the airplane.

**(e) Compliance**

Comply with this AD within the compliance times specified, unless already done.

(1) At the next piece-part exposure after the effective date of this AD, do the following:

(i) Remove from service second-stage HPT air seals, P/N 50L960, 50L976, and 50L041.

(ii) Fluorescent-penetrant inspect (FPI) second-stage HPT air seal, P/N 50L041, for a through-crack in the front forward fillet radius.

(iii) If a through-crack in the front forward fillet radius is found, remove the first-stage HPT hub, second-stage HPT hub, and second-stage HPT blade retaining plate from service. Do not reinstall the first-stage HPT hub, second-stage HPT hub, or second-stage HPT blade retaining plate into any engine.

(2) For engines with second-stage HPT air seals, P/N 50L041, installed, perform initial and repetitive inspections for cracks on-wing until the part is removed from the engine as follows:

(i) Perform an initial eddy current inspection (ECI) for cracks prior to reaching 2,200 cycles-since-new or within 100 cycles-in-service after the effective date of this AD, whichever occurs later.

(ii) Thereafter, repeat the ECI every 1,200 cycles since last inspection, or fewer, depending on the results of the inspection.

(iii) Use section 4.0 of the appendix of PW Alert Service Bulletin (ASB) No. PW4G-112-A72-330, Revision 2, dated July 11, 2013, to perform the inspection and use paragraph 8 of the Accomplishment Instructions of PW ASB No. PW4G-112-A72-330, Revision 2, dated July 11, 2013, to disposition the results of the inspection.

**(f) Installation Prohibition**

After the effective date of this AD, do not install any second-stage HPT air seal P/N 50L041, P/N 50L960, or P/N 50L976 into any engine.

**(g) Definitions**

(1) For the purpose of this AD, piece-part exposure is when the second-stage HPT air seal is removed from the engine and fully disassembled.

(2) For the purpose of this AD, a through-crack is a crack that has propagated through the thickness of the part and can be seen on both the inner diameter and outer diameter of the front forward fillet radius.



**(h) Credit for Previous Actions**

(1) If you performed an ECI of the second-stage HPT air seal before the effective date of this AD, using PW ASB No. PW4G-112-A72-330, Revision 1, dated February 14, 2013, or earlier version, you have met the requirements of paragraph (e)(2)(i) of this AD.

(2) If you performed an in-shop FPI of the second-stage HPT air seal before the effective date of this AD, you have met the requirements of paragraph (e)(2)(i) of this AD.

**(i) Alternative Methods of Compliance (AMOCs)**

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request.

**(j) Related Information**

(1) For more information about this AD, contact James Gray, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: (781) 238-7742; fax: (781) 238-7199; email: [james.e.gray@faa.gov](mailto:james.e.gray@faa.gov).

(2) For service information identified in this AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06108; phone: (860) 565-8770; fax: (860) 565-4503.

(3) You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call (781) 238-7125.

Issued in Burlington, Massachusetts, on May 28, 2014.

Colleen M. D'Alessandro,  
Assistant Directorate Manager, Engine & Propeller Directorate,  
Aircraft Certification Service.

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